UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,803	02/21/2002	Raanan A. Miller	3239.1000-017	4435

21005 7590 08/18/2003

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER	
GURZO, PAUL M	
ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 08/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/082,803	Applicant(s) MILLER ET AL.	
	Examiner Paul Gurzo	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/7/02* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33,35-42 and 44-127* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17,19-33,35,36,40-42,44-69,75-121 and 124-127* is/are rejected.

7)☒ Claim(s) *18,37-39,70-74,122 and 123* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-17,19-33,35,36,40-42,44-69,75-121 and 124-127 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carnahan et al. (5,420,424).

Regarding claim 1, Carnahan (424) teaches an ion mobility mass spectrometer that impresses an asymmetrical periodic potential (col. 5, lines 64-67). Fig. 1 clearly depicts a longitudinal axis for the flow of ions and a filtering means can be configured between the inlet (16) and outlet (19) (col. 4, lines 33-35). They teach a controller that impresses a periodic asymmetric potential capable of creating a transverse field during the flow of carrier gas (Abstract). They teach numerous ionizers (col. 3, lines 3-8), and it is obvious that they will all act to propel the ions flowing into the filter. Though they do not explicitly teach the selection of species. However, they teach that ions traversing the length will exit for detection and measurement (col. 3, lines 22-27), and it is obvious that only desired ions will successfully traverse. Further, it is well known in the art of mass spectrometry that desired species are selected using the necessary filter, and it is obvious to one of ordinary skill in the art at the time the invention was made to select desired species with the filter because this will lead to efficient detection of desired ions.

Regarding claims 2-13,66-68, 424 teaches an ion source (30) and a detector (40), the application of an electric field (Abstract), and electronic control (50) of the field. They also teach a pair of electrodes (21 and 22) facing each other over the flow path and having pads for connection to an electronic controller (col. 4, lines 47-66). The electronic controller (50) is connected to the electrodes to impress first and second electrical potentials, and it is obvious that this will create the desired filter field that can simultaneously using the appropriate members. Further, insulating electrodes is well known in the art. 424 also teaches an ionization source chosen from the group consisting of corona, electrospray, radiation source, etc. (col. 3, lines 3-5).

Regarding claim 14, 424 teaches a housing (11) in Fig. 1 defining a cylindrical geometry.

Regarding claims 15-17,19-29, any modification to include a second pair of electrodes, a constant or carrying electric field, biasing, is considered an obvious modification, and it is obvious that the ions are urged to the center of the flow path for efficient transmission.

Regarding claims 30-33 and 35-36, 424 depicts, in Fig. 1, the common longitudinal space and the ion source must be downstream of the detector. Further, any modification to include a reverse gas or different placement of electrodes is an obvious matter of design choice to improve efficiency.

Regarding claims 40-42 and 44-45, 424 teaches an electronic controller that teaches on the use of a resistive divider circuit, electrodes, and an ion flow from the ionization region as well as the generation of an electric field as taught above. Further, it is known in the art that electrodes can be coated with a resistive or insulating coating.

Regarding claims 46-48 and 52-57, 424 teaches a first and second inlet (16 and 17) that will obviously act as a first and second flow path. They teach the use of electrodes as stated

above. Further, the flow will propel the ions through the filter field, and the electrodes will generate an electric field and have a potential applied to them as stated above.

Regarding claims 49-51 and 64-65, 424 teaches the use of a pump to supply a low flow rate of air into the gap (col. 2,lines 45-50) and teaches a housing (11).

Regarding claims 58-63, 424 teaches electrodes and teach an insulating surface (66), and it is known that electrodes can be made of a resistive coating. They teach the claimed asymmetric periodic voltages (potential) and generating an electric field by the electrodes as stated above. Further, it is known in the art to apply an RF signal to the electrodes to generate the appropriate field. They teach an electronic controller as stated above.

Regarding claims 69 and 75-81, 424 teaches an ion mobility mass spectrometer that impresses an asymmetrical periodic potential (col. 5, lines 64-67). Fig. 1 clearly depicts a longitudinal axis for the flow of ions and a filtering means can be configured between the inlet (16) and outlet (19) (col. 4, lines 33-35). It also shows the flow path from an ionization region (30) toward a detector region (40). They teach a controller that impresses a periodic asymmetric potential capable of creating a transverse field during the flow of carrier gas (Abstract). They teach numerous ionizers (col. 3, lines 3-8) and a housing (11). It is obvious that they will all act to propel the ions flowing into the filter, and any modification of the electrodes or voltage (potential) is considered obvious.

Regarding claim 82, 424 teaches a method for analysis of chemicals in a sample comprising the steps of placing an ion filter in a flow path (col. 4, lines 33-35), said flow path having a longitudinal axis for the flow of ions (Fig. 1), creating an asymmetric filter field transverse the flow path (Abstract). Because the filter is disposed between the inlet and outlet it

is obvious that flow path is in cooperation with the filter. They teach that ions traversing the length will exit for detection and measurement (col. 3, lines 22-27), and it is obvious that only desired ions will successfully traverse. Further, it is well known in the art of mass spectrometry that desired species are selected using the necessary filter, and it is obvious to one of ordinary skill in the art at the time the invention was made to select desired species with the filter because this will lead to efficient detection of desired ions.

Regarding claims 83-90, 424 teaches a detector (40) for detection of the ions passed by the filter as stated above, and teaches an electronic controller (50) for controlling the asymmetric field (col. 5, line 57 - col. 6, line 8). They also teach a pair of electrodes (21 and 22) facing each other over the flow path and having pads for connection to an electronic controller (col. 4, lines 47-66). The electronic controller (50) is connected to the electrodes to impress first and second electrical potentials, and it is obvious that this will create the desired filter field that can simultaneously using the appropriate members. Further, insulating electrodes is well known in the art. 424 also teaches an ionization source chosen from the group consisting of corona, electrospray, radiation source, etc. (col. 3, lines 3-5).

Regarding claims 91 and 105, 424 teaches a housing (11) in Fig. 1 defining a cylindrical geometry.

Regarding claims 92-102, any modification to include a second pair of electrodes, a constant or carrying electric field, biasing, is considered an obvious modification, and it is obvious that the ions are urged to the center of the flow path for efficient transmission.

Regarding claims 103-104 and 106-112, 424 teaches and ion filter with a carrier gas as well as the use of a plurality of filter electrodes (21 and 22), and any modification to include a

reverse gas or different placement of electrodes is an obvious matter of design choice to improve efficiency. In addition, it is well known in the art the DC voltages and RF signals can be applied to electrodes to propel and filter the electrodes for increased transmission.

Regarding claim 113, 424 teaches an ion mobility mass spectrometer that impresses an asymmetrical periodic potential (col. 5, lines 64-67). Fig. 1 clearly depicts a longitudinal axis for the flow of ions and a filtering means can be configured between the inlet (16) and outlet (19) (col. 4, lines 33-35). They teach a controller that impresses a periodic asymmetric potential capable of creating a transverse field during the flow of carrier gas (Abstract). They teach numerous ionizers (col. 3, lines 3-8), and it is obvious that they will all act to propel the ions flowing into the filter. Though they do not explicitly teach the selection of species. However, they teach that ions traversing the length will exit for detection and measurement (col. 3, lines 22-27), and it is obvious that only desired ions will successfully traverse. Further, it is well known in the art of mass spectrometry that desired species are selected using the necessary filter, and it is obvious to one of ordinary skill in the art at the time the invention was made to select desired species with the filter because this will lead to efficient detection of desired ions.

Regarding claims 114-118, it is obvious that the species are propelled, and any type of electrode configuration and detection characteristics (trajectory, etc.) is possible.

Regarding claim 119, 424 teaches an ion mobility mass spectrometer that impresses an asymmetrical periodic potential (col. 5, lines 64-67). Fig. 1 clearly depicts a longitudinal axis for the flow of ions and a filtering means can be configured between the inlet (16) and outlet (19) (col. 4, lines 33-35). They teach a controller that impresses a periodic asymmetric potential capable of creating a transverse field during the flow of carrier gas (Abstract). They teach

numerous ionizers (col. 3, lines 3-8), and it is obvious that they will all act to propel the ions flowing into the filter. They also teach an analytical gap (col. 2,lines 51-68), and it is obvious that the filter is disposed downstream from the analytical gap. They also teach a detector (40), and it is obvious that this detector can be used to detect any type of ions necessary because it is well known in the art that detectors are able to measure any desired groups of ions.

Regarding claims 120,121, and 124-127, 424 teaches a pair of electrodes (21 and 22), and it is obvious that the filter passes desired ions. Further, the addition of a coupling part is considered obvious because some type of sample preparation must exist for this apparatus to effectively function.

Allowable Subject Matter

Claims 18, 37-39, 70-74, and 122-123 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The closest prior art of record, Carahan et al., do not teach or render obvious insulting electrodes in the ion flow region from electrodes in the ion filter region.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Eisele et al. (5,218,203)

Sacristan (5,455,417)

Pertinaarides et al. (5,763,876)

Guevremont et al. (6,504,149)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Gurzo whose telephone number is (703) 306-0532. The examiner can normally be reached on M-Thurs. 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

PMG
July 30, 2003

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800